

THURSDAY, APRIL 2, 1885

THE METEOROLOGY OF THE ATLANTIC

Deutsche Seewarte. Segelhandbuch für den Atlantischen Ozean. Mit einem Atlas von 36 Karten. Herausgegeben von der Direktion. Mit zahlreichen in den Text gedruckten Holzschnitten und neun Steindruck-Tafeln. (Hamburg, 1885.)

THE Atlas of the Atlantic which was published by the "Deutsche Seewarte" in 1882, has at length, after a term of three years, been joined by the text, which was intended, in the first instance, to have accompanied it, and of which it was described as an appendix. But though separated in their publication by this wide interval, in spirit and in sense, at least, the two are indissolubly linked together, and either one without the other is but an imperfect and mutilated fragment. Of their excellence, now that they are united, it is unnecessary to speak. When Dr. Köppen, with his able coadjutors, writes, and Dr. Neumayer edits such a work as this physical and meteorological survey of the Atlantic Basin it would be waste of words to say more than that the result of their co-operation must at once take rank as a standard book of reference on this subject. More especially valuable is it in those sections which are descriptive of ascertained facts, and are based to a very great extent on recent, frequently on original observations. The detail of these occupies the largest proportion of the space, leaving but little room for theorising or doubtful matter, and absolutely none for the repetition of those many myths and false statements which have been so often presented to us by successive writers, one blindly copying from another, that we had almost begun—like the poor Hindoo with the mangy cur—to believe in their truth. It is scarcely credible, but is nevertheless a fact, that in this large volume, of nearly 600 closely-printed pages in royal 8vo, there is not a word about ships bound to the West Indies throwing cargoes of horses overboard in the horse-latitudes, which are, however, mentioned as "Rossbreiten"; and the reader will look in vain for the time-honoured allegation that the winter storms on our own coasts are extensions of the West India hurricanes.

The name "Belt of Calm"—"Stillengürtel"—is unfortunately preserved; though the particular "Belt" which has been asserted to exist near the equator is ruthlessly spoken of as "der sogenannte Stillengürtel"; and the description of those near the tropics gives no countenance to the pestilential doctrine which the name embodies, but is to this effect:—"Two great whirls occupy the tropical and temperate regions of the Atlantic Ocean; each of these has in the centre a maximum air pressure, around which, in accordance with Buys-Ballot's law, the wind circles, in the direction of the daily motion of the sun in the respective hemisphere. The equatorial sides of these whirls are formed of the trade winds, which thus become more polar on the east side of the ocean, whilst on the west side their direction is due east and so passes to equatorial." "In summer the transition between the west wind of the North Atlantic and the trade takes place, on the coast of Portugal and Morocco, through N.W., N., and N.E., and in the opposite sense on the

coast of North America, through S.E., S., and S.W. In winter, on the other hand, the region of high pressure partakes more of the nature of a belt extending from one continent to the other, and the transition is effected in a less regular manner, sometimes with calms, and sometimes with one or more stormy veerings of the wind right round the compass" (pp. 87, 91). All this has, of course, been well known to meteorologists for several years, though it has seldom before been clearly and concisely stated in a practical work of this nature. It seems therefore the greater pity that the name "Belt of Calm" should have been allowed to remain; and it would almost seem that its baneful influence has led the authors to write:—"On the South American coast, from 1°-3° N. latitude, calms and rains prevail almost the whole year through" (p. 65): a statement which does not fully agree either with the wind charts of the atlas, or with the direction in our English "South American Pilot"; according to which the variable winds, calms, and rains last only from the end of April to the beginning of July. The exaggeration is in all probability due to a dim recollection of obsolete maps and a theory that ought to be obsolete, but which from time to time revives in the most unexpected places. To some similar source is perhaps to be assigned the statement that "land and sea breezes are to be found along the whole west coast of Africa from Morocco to the Congo," which is only partially true: on the northern part of this coast, land and sea breezes are, practically speaking, unknown; though from the Senegal southwards they are regular enough.

It is impossible not to regret that statements like this should have been loosely hazarded; for though they are not of much practical importance either way, they tend to raise an unjust suspicion that fanciful theory has been sometimes permitted to dictate the statement of the facts, instead of exact and careful observation. It would have been safer and therefore better to have omitted theorising altogether; for, however tempting it may be, no one knows better than the learned and distinguished editor of this volume that there is as yet scarcely a single point in theoretical meteorology which can be said to be fixed with absolute certainty, or which can be fully and satisfactorily explained. The question of air pressure is one of these. In the theory of meteorology no problem is perhaps so interesting and so important: but in the practical application of rules to which the barometer is a guide, the cause of the variations of the barometer is of no importance whatever. The authors of this book are agreed in the opinion that the pressure of the air at any place depends solely on the weight of the superimposed column of air, and that this weight is dependent on temperature. A great many meteorologists hold this opinion; but many, on the other hand, do not; and, as has been said, there is room to doubt. Temperature alone does not seem to offer any explanation of the barometric maxima near the tropics, or of the barometric minimum near Iceland; still less does it offer any explanation of what Maury first called "The Barometric Anomaly at the foot of the Andes"—the high pressure which has been observed, amidst sweltering heat and extreme humidity, in the valley of the Amazon.

But this is irrelevant to the main purpose of the "Segelhandbuch," and does not at all detract from its

great value as a practical guide. As such, it takes what is, in some respects, a new departure: it rejects the familiar notion that as storms are mere derangements of the system of winds, they deserve, in a systematic study, nothing more than an incidental notice; and it puts prominently forward the idea that, on the contrary, they ought to be studied in very full detail; because, as it argues, the derangements are rather exaggerations than alterations of the system, and are thus capable of serving as a microscope for the student's clearer instruction. It is an idea which has been well and fully worked out; and with a care and industry which supply the reader with an exhaustless mine of illustration and example.

J. K. L.

MUIR'S "PRINCIPLES OF CHEMISTRY"

Principles of Chemistry. By M. M. Pattison Muir, (Cambridge University Press, 1884.)

DURING the last two decades chemistry has made, possibly, its greatest strides, and has unquestionably drawn to itself a greater following of students in this country than in any previous period. One result of that has been a multiplication of text-books such as perhaps no other science can show. This is only as it should be in the case of a living and progressing science like chemistry. But if one musters the style of text-book produced during this period it becomes painfully doubtful whether they as a whole have kept abreast of the mental capacity which should have been, and undoubtedly has, developed during this period.

Chemistry is certainly a practical science, and that in a very full acceptance of the term; but at the same time it has a history as a practical and especially as a theoretical or mental study second to none, and the unsatisfactory part of the majority of the text-books of modern date is that this growth and development, and the invaluable effect of this as a mental training, have been almost completely ignored.

As mathematical men have been heard to say when going through a course of chemical drudgery, "there seems to be nothing but a lot of isolated facts to learn up." And one cannot be surprised at the remark. The text-books may be roughly divided into two sorts—those of a dictionary character and those intended as an introductory or elementary teacher; the former fulfil their intention, which can scarcely be said of the latter, in which the points of principal theoretical interest are "atomicity" and "atomic and molecular combination," and various ways of writing "formulae."

It is much to be feared that the teaching of the past few years in this country in chemistry has assumed such an intensely "practical" form that philosophical chemistry has been left very much out in the cold. The numerous examinations in which practical work is required has raised up, unfortunately, an army of "test-tubers" and crammers whose theoretical knowledge is of the slenderest. Without in the least wishing to underrate the value of practical work, it does certainly appear, looking only at the chemical literature of the past few years, that theoretical chemistry has to a great extent receded from view in favour of practical, and that of a not very thorough kind.

In the present book Mr. Muir has made up for the lacking in our text-books, and has certainly rendered a real service to the English student who aspires to be something more than a mere test-tuber and writer of graphic formulæ.

As the author informs us, the book is intended for students who already have some elementary acquaintance with the science, and is meant to give "a fairly complete account of the present state of knowledge regarding the principles and general laws of chemistry." And in this the author has certainly succeeded; for it may with certainty be said that we have not a more comprehensive work of the kind in the language. For although it does not pretend to the rank of a Kopp, still it quite fills the place in English chemical literature that Lothar Meyer's "Modernen Chemie" does in the German, which latter work, the author tells us, he has made "free use of."

The subject-matter of the book is necessarily extensive, and has been divided into two main parts—Chemical Statics and Chemical Kinetics. The historical method of treatment adopted cannot fail to be appreciated by the real student who aspires to be something more than a mere recipient of dry facts.

The chapter on Atomic and Molecular Systems and on the Application of Physical Methods to Questions of Chemical Statics, as well as that on Affinity, are condensations from all the most recent works on the subjects, and are, as a rule, clear and concise. The references to originals, &c., &c., are numerous, and the mechanical errors throughout the work are surprisingly few.

The book should be very useful to students training for teachers, and who may not have the advantage of reference to original literature on the numerous subjects treated of.

OUR BOOK SHELF

Eine Weltreise. Plaudereien aus einer Zweijährigen Erdumsegelung von Dr. Hans Meyer. (Leipzig: Verlag des Bibliographischen Instituts, 1885.)

THIS handsome volume is something more than the work of a "globe-trotter," even of a very amusing "globe-trotter." Dr. Meyer sailed down the Danube to Constantinople, thence to Athens, Syria (where he visited Smyrna, Beyrout, Damascus, and Jerusalem), Egypt, and by the Red Sea to Bombay. He then travelled through Northern India to Calcutta, and from Madras through Southern India to Ceylon. The journey in the Far East included Singapore, a considerable portion of Java, the Philippines, Hong Kong, Shanghai, and Japan. Thence he reached the United States, through a large part of which he travelled, Mexico, Cuba, and so back to Europe. The journey was more extensive than the usual modern journey around the globe; Java appears to have been thoroughly visited, but the only place in which the work displays any mark of originality is in the Philippines. The scenes and experiences by the way are described with much liveliness, but soon after his arrival in Manila he made a journey into the northern mountainous regions of Luzon, for the purpose of studying the Igorrotos and other tribes having their habitat there. The story of the journey, which occupied about three months, is full of interest, and the ethnology of these tribes is discussed in a special appendix. Prof. Blumentritt, the Austrian scholar, who has devoted many years to the study of the archipelago, especially to the vast Spanish literature of the seventeenth and eighteenth centuries relating to it, comes to the following conclusions on its